SELF SERVICE TERMINAL

BACKGROUND OF THE INVENTION

The present invention relates to a self service terminal (SST). In particular the invention relates to an SST including a human iris identification system.

Iris identification systems are used in SSTs such as ATMs (automated teller machines) for identifying a user of the terminal without the user having to, provide an identification card.

In such a system, a user must first be enrolled. Enrolment involves obtaining an image of the iris of a user and processing this image to produce an iris signature (or code). The iris code is stored in a database of authorized users.

When an authorized user wishes to use an ATM implementing iris identification, the user looks at a camera associated with the ATM, and the camera records an image of the user's iris. This recorded image is processed to produce an iris code. The user's iris code is compared with the database of stored iris codes to find the closest match. If the closest match meets a predetermined acceptance criterion (for example, greater than a 99.999% probability of being correct) then the closest match is assumed to be the user, and the user is identified accordingly.

This system works effectively if users keep their eyes motionless and wide open so that a clear image of their iris can be obtained and recorded. Where users can be trained to use iris identification (for example where iris identification ATMs are located on military bases or on naval ships and are used by military personnel) there is generally very little problem in identifying a user. However, when iris identification ATMs are used by the general public, the ATMs may have difficulty in identifying a user because of the user's continuous head and/or eye movement.

SUMMARY OF THE INVENTION

It is an object of an embodiment of the present invention to obviate or mitigate the above problem.

According to one aspect of the invention there is provided a self service terminal including a human iris identification system, the system comprising a camera for recording an image of a human iris via a lens, and a processor for processing the recorded image, characterized by a plurality of visual indicators associated with the lens for directing a user's eye towards the lens of the camera.

It should be appreciated that the visual indicators are associated with the lens by being in general alignment with an optical axis which passes through the user's eye and the lens; for example, the visual indicators may be in registration with the axis which passes through the user's eye and the lens. It should also be appreciated that the term lens is used herein in a broad sense, to include different types of light gathering optics. A lens may include more than one optical element. The light gathering optics may deflect received light into the camera; for example, a mirror arrangement may be used to deflect and convey light to the camera.

Each visual indicator may comprise a single indicator element at least partially surrounding the center of the lens; alternatively, each indicator may comprise two or more indicator elements, each element being generally equidistant from the center of the lens.

Preferably, each visual indicator is spaced from the center of the lens by a different amount. Preferably, each visual indicator defines an axis which is co-axial with an axis through the center of the lens.

Preferably, each visual indicator is selectively energizable, so that, in use, the indicators may be successively energized, starting with the indicator furthest from the center of the lens and finishing with the indicator closest to the center of the lens, thereby guiding a user's eye to the center of the lens.

Where each visual indicator uses a single element, the element may be generally circular, and each visual indicator may have a different diameter so that the indicators are generally concentric about the center of the lens.

The effect of the visual indicators is to provide a series of sequentially illuminated lights for guiding a user's eye towards the lens of the camera.

Preferably, the visual indicators are removed (de-energized) when the user has been identified.

In one embodiment, the color of the visual indicators may change once identification has been established, for example from red light to green light.

The visual indicators may be permanently illuminated or they may pulsed so that they flash. As identification nears completion, the frequency of the flashing may be changed by the iris identification system. For example, the frequency of the flashing may be increased as the identification system progresses towards identifying the user.

An advantage of the invention is that as the visual indicators appear to advance towards the center of the lens, the user's eyes are guided to the center of the lens thereby aligning the user's iris with the camera. No previous training is required to enable a user to use this system.

According to a second aspect of the invention there is provided a human iris identification system, the system comprising a camera for recording an image of a human iris via a lens, and a processor for processing the recorded image, characterized by a plurality of visual indicators associated with the lens for directing a user's eye towards the lens of the camera.

According to a third aspect of the invention there is provided a method of directing a user's eye towards a lens of a camera used in a human iris identification system, the method characterized by the steps of: providing a plurality of visual indicators, each visual indicator being spaced from the center of the lens by a different amount, and successively energizing individual indicators starting with the indicator furthest away from the center of the lens so that a user's eye is directed towards the lens.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of the invention will become apparent from the following specific description, given by way of example, with reference to the accompanying drawings, in which:

FIG. **1** is a schematic diagram of an SST incorporating an iris identification unit in accordance with an embodiment of the invention;

FIG. **2** is a block diagram of the SST of FIG. **1**;

FIG. **3** is a simplified schematic view of a typical arrangement and orientation of details of FIGS. **1** and **2**;

FIG. **4** is a schematic view of visual indicators displayed on a panel used in FIG. **1**; and

FIG. **5** is a schematic view of alternative visual indicators displayed on a panel used in FIG. **1**.

DETAILED DESCRIPTION

Referring to FIG. **1**, which shows an SST **10** in the form of an ATM, the ATM **10** includes a user interface **12** which